

- u/s applied to pipe

PATENT SPECIFICATION

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(54) APPARATUS FOR DISPENSING A LIQUID

(71) We, DAWE INSTRUMENTS LIMITED, a British Company of Concord Road, Western Avenue, London W3 0SD, England, do hereby declare the invention, for which we pray that a patent may be granted to us, and the method by which it is to be performed, to be particularly described in and by the following statement:—

This invention relates to apparatus for dispensing a liquid.

The invention resides in apparatus for dispensing a liquid including a container for the liquid and a tube connecting the container to a dispensing tap so that, in use, the liquid flows by way of the tube to the tap and an electro-mechanical transducer for subjecting the liquid to vibration, the transducer being received within a casing and having its radiating surface bonded to a wall of the casing capable of transmitting the vibration, and said tube being attached to the external surface of said wall.

The accompanying drawing is a sectional view of apparatus according to one example of the invention.

Referring to the drawing, the apparatus includes a piezoelectric disc 11 which is received in a substantially cup-shaped metal casing 12 and has one major surface bonded to the base 13 of the casing by an electrically conductive, epoxy adhesive 14. Thus, in use, one electrical connection to the disc 11 can be made by way of the casing 12, the other electrical connection being made by way of a conductive spring strip 15 which is soldered at one end to a printed circuit board 16 and is flexed at its opposite end against the other major surface of the disc 11. Attached to the external surface of the base 13 is a metal tube 17 which is held in position by an epoxy adhesive 18.

In use, liquid flows through the tube 17 and, to subject the liquid to a vibration, the disc 11 is connected by way of the casing 12 and spring strip 15 to an a.c. source

which causes the disc to expand and contract, preferably radially and preferably at an ultrasonic frequency. Since the base 13 is metal, the dimensional changes of the disc 11 cause it to undergo vibration which is then transmitted to the liquid by the adhesive 18 and the metal tube 17. The vibration thereby induced in the liquid flowing through the tube 17 is used to process the liquid, such as for example by accelerating or stimulating chemical reactions within the liquid, or producing physical effects within the liquid such as frothing, de-gassing or homogenisation. In the particular example described, the apparatus is intended to produce frothing in beer which is supplied from a storage container via the tube 17 to a dispensing tap by way of a metered dispensing device. The dispensing device is operated electrically from an a.c. source and the printed circuit board 16 is arranged so that it operates from the same a.c. source as the dispensing device. Preferably, the a.c. source is arranged to cause the disc to vibrate at a frequency in the range 40–80 Hz, the disc most preferably being arranged to resonate radially at the frequency employed. Using frequencies within this range it is found that the apparatus can be used to froth beer even when cooled below 12°C.

As an alternative to the apparatus described above the tube 17 may be integrally attached to the base 13 of the casing 12.

WHAT WE CLAIM IS:—

1. Apparatus for dispensing a liquid including a container for the liquid, a tube connecting the container to a dispensing tap so that, in use, the liquid flows by way of the tube to the tap, and an electro-mechanical transducer for subjecting the liquid to vibration, the transducer being received within a casing and having its radiating surface bonded to a wall of the casing capable of transmitting the vibration, and said tube

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being attached to the external surface of said wall.

2. Apparatus as claimed in Claim 1, wherein said wall is electrically conductive and one electrical connection to the transducer is made by way of the wall.

5 3. Apparatus as claimed in Claim 1 or Claim 2, wherein the tube is integral with the wall.

10 4. Apparatus as claimed in any one of the preceding Claims, wherein the transducer is arranged to produce ultrasonic vibrations.

5 5. Apparatus as claimed in Claim 4, wherein the transducer is defined by a single piezo-electric element.

15 6. Apparatus as claimed in Claim 5, wherein said element is arranged to resonate at a frequency in the range 40—80 kHz.

7. Apparatus as claimed in any one of

the preceding Claims, and including a metered dispensing device for controlling the flow of said liquid between said container and said tap.

20 8. Apparatus for dispensing a liquid comprising the combination and arrangement of parts substantially as hereinbefore described with reference to and as shown in the accompanying drawing.

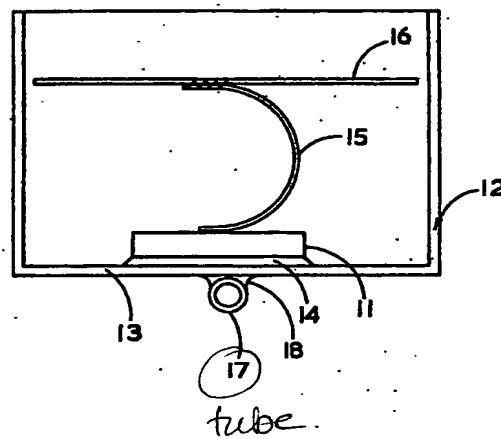
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